

Application No. 10/747,616  
Response to Office Action mailed January 24, 2006  
Atty. Dkt. No.: C261.1040.1

*In the Specification:*

Please insert the following paragraphs in place of the paragraphs as originally filed:

[0006] Prior art processes [U.S. Pat. No. 5,543,223, U.S. Pat. No. 5,830,545, U.S. Pat. No. 4,753,832] to achieve barrier properties in packaging materials are based on the multi-layer polymer films, where the barrier property is given by materials like, ethylene-vinyl alcohol copolymer (EVOH), Saran<sup>®</sup>-Polyvinylidene fluoride (PVDF), Metallised PP etc. These materials are expensive compared to the general purpose plastics like PE or PP and also involve energy intensive melt mixing and extrusion techniques to make the multi-layer material. Research and developments efforts are being reported to make barrier materials based on amorphous polymers. As opposed to the prior art, the present invention uses coating compositions, without using any expensive processing operations or additives to make barrier coating materials.

[0028] Composition 1

Epoxy resin	24-48%
TiO <sub>2</sub>	24-48%
Talc	9-22%
Clay	0-30%
Colorant	0-1%
Barytes	0-5%
Nilse Nilset <sup>TM</sup> 117	0.1-0.2%
Hapen <sup>TM</sup> XZ	0.05-0.1%
Dispersitol <sup>TM</sup> Dispersitol <sup>TM</sup>	0-0.1%
Borchi <sup>®</sup> GOL E2	0.5-0.8%
Solvent	q.s (for application)

Application No. 10/747,616  
 Response to Office Action mailed January 24, 2006  
 Atty. Dkt. No.: C261.1040.1

## [0029] Composition II

Alkyd resin	24-48%
TiO <sub>2</sub>	24-48%
Talc	9-22%
Clay	0-30%
Catalyst	0.1-0.5%
Colorant	0-1%
Barytes	0.5%
NilsetNilset™ 117	0.1-0.2%
HapcoHapco™ NXZ	0.05-0.1%
Dispersito!Dispersito!™	0-0.1%
BorchiBorchi® GOI, E2	0.5-0.8%
Solvent	q.s.(for application)

## [0030] Composition III

Polyester polyol +isocyanate	24-48%
TiO <sub>2</sub>	28-40%
Talc	9-22%
Clay	0-30%
Colorant	0-1%
Barytes	0.5%
NilsetNilset™ 117	0.1-0.2%
HapcoHapco™ NXZ	0.05-0.1%
Dispersito!Dispersito!™	0-0.1%
BorchiBorchi® GOI, E2	0.5-0.8%
Solvent	q.s.(for application)

## [0031] Composition IV

Castor polyol + isocyanato	24-48%
TiO <sub>2</sub>	18-40%
Talc	9-22%
Clay	0-30%
Colorant	0-1%
Barytes	0.5%
NilsetNilset™	0.1-0.2%
HapcoHapco™ NXZ	0.05-0.1%
Dispersito!Dispersito!™	0-0.1%
BorchiBorchi® GOI, 1/2	0.5-0.8%
Solvent	q.s.(for application)

Application No. 10/747,616  
 Response to Office Action mailed January 24, 2006  
 Atty. Dkt. No.: C261.1040.1

## [0032] Composition V

Uralkyd resin	28-40%
TiO <sub>2</sub>	31-52%
Talc	9-22%
Clay	0-30%
Catalyst	0.1-0.5%
Colorant	0-1%
Barytes	0-5%
NilsetNilset™ 117	0.1-0.2%
HapcoHapco™ NXZ	0.05-0.1%
DispersitolDispersitol™	0-0.1%
BorelliBorelli® GOL E2	0.5-0.8%
Solvent	q.s. (for application)

## [0040] Example. 2

Epoxy resin	34 %
TiO <sub>2</sub>	34%
Talc	6%
Calcined clay	4.8-28%
Colorant	0.1%
Barytes	5%
NilsetNilset™ 117	0.1-0.2%
HapcoHapco™ NXZ	0.05 -0.1%
DispersitolDispersitol™	0.1%
BorelliBorelli® GOL E 2	0.5-0.8%
Solvent	25%

[0017] A pressure differential of about 1-5 kgs/cm<sup>2</sup> (100-500 kPa) was maintained across the membrane during experiments. All experiments were conducted at room temperature (30 ± .2°C). The feed and permeate lines were initially evacuated by means of a vacuum pump. Pure oxygen was introduced slowly into the feed line by means of a mass flow controller. The desired feed pressure difference was maintained in the test cell. The permeate gas sample was collected in SS 316 gas sampler using solar grade nitrogen (>99.9% purity) as the carrier gas (the flow rate of the carrier gas was controlled by a soap bubble meter). Only steady state samples were collected. The feed and permeate samples were analyzed with NueonNucon™ Gas

Application No. 10/747,616  
Response to Office Action mailed January 24, 2006  
Atty. Dkt. No.: C261.1040.1

Chromatograph Model 765, India, equipped with a CTR dual column and a Thermal conductivity Detector (TID). The concentration of the permeated oxygen was determined and gas permeability's were calculated.

[0050] Example 3

Alkyd	38.5%
TiO <sub>2</sub>	38%
Talc	6.6%
Clay	4.7%
Catalyst	0.5%
Colorant	0.1%
Barytes	5%
Nilset <sup>TM</sup> 117	0.1-0.2%
Hapco <sup>TM</sup> NXZ	0.05 - 0.1%
Dispersitell <sup>TM</sup> Dispersitol <sup>TM</sup>	0.1%
Borehi <sup>TM</sup> Gol E 2	0.5-0.8%
Solvent	14%

Application No. 10/747,616  
Response to Office Action mailed January 24, 2006  
Atty. Dkt. No.: C261.1040.1

## [0053] Example 4:

Polyester polyol	27.8%
Isocyanate	25%
TiO <sub>2</sub>	33%
Talc	5.6%
Calcined Clay	4.7 to 28%
Colorant	0.1%
Barytes	5%
<u>Nilset</u> <u>Nilset</u> <sup>TM</sup> 117	0.1-0.2%
<u>Hapeo</u> <u>Hapeo</u> <sup>TM</sup> NXZ	0.05 -0.1%
<u>Dispersitol</u> <u>Dispersitol</u> <sup>TM</sup>	0.1%
<u>Borchi</u> <u>Borchi</u> <sup>®</sup> Gol E 2	0.5-0.8%
Solvent	19.8%

## [0055] Example 5:

Further example of the formulation used is made according to the formulation

Caster polyol	26%
Isocyanate	22%
Tio <sub>2</sub>	34%
Talc	5.8%
Clay	5-30%
Colorant	0.1%
Barytes	5%
<u>Nilset</u> <u>Nilset</u> <sup>TM</sup> 117	0.1-0.2%
<u>Hapeo</u> <u>Hapeo</u> <sup>TM</sup> NXZ	0.05 -0.1%
<u>Dispersitol</u> <u>Dispersitol</u> <sup>TM</sup>	0.1%
<u>Borchi</u> <u>Borchi</u> <sup>®</sup> Gol E 2	0.5-0.8%
Solvent-	20%

Application No. 10/747,616  
Response to Office Action mailed January 24, 2006  
Atty. Dkt. No.: C261.1040.1

[0057] Example 6:

The following example further illustrates the formulation used for the coating composition.

Uralkyd	48%
TiO <sub>2</sub>	28%
Talc	4.8%
Clay	4.8-28%
Colorant	0.1%
Barytes	5%
Nilset <sup>TM</sup> 117	0.1-0.2%
Hapeo <sup>TM</sup> NXZ	0.05 -0.1%
Dispersitol <sup>TM</sup>	0.1%
Borehi <sup>TM</sup> Gol E 2	0.5-0.8%
Toluene	7%

[0059] A comparative data is provided below with the commercially available materials:

11 W, V, T, R O<sub>2</sub> (g/m<sup>2</sup>)..... 24 hr. Sample (cc mil/100in<sup>2</sup>, dat, atm) 38°C 90% RH) Metallized

PP 5.07 3.9-4.8 Saran<sup>TM</sup> 3E 1 2.8 LDPE 250-800 15.5-18 HDPE 30-250 4.7-10.8 EVOH

1.15 2.2-5.9 PET 4.8-9 21 IICT-unmodified coating 11-18 3.44-26 Clay-modified film

1.9-3.1 1.97-3.44 LDPE/paper/IICT coating Below detectable range 2.46-3.26